To: Albright, David[Albright.David@epa.gov]
Cc: Dermer, Michele[Dermer.Michele@epa.gov]; Robin, George[Robin.George@epa.gov]
From: Coffman, Joel
Sent: Thur 12/10/2015 9:14:14 PM
Subject: Gas Storage Wells in California

I have started a fact sheet on Natural gas storage (and the wells)… I have not tied this in directly with why our UIC Regs are not the ones in charge of these gas storage wells, but, hopefully, it is a start to explaining this situation… Will do more but have to leave after 2 for a dentist appt. Joel

Drilling and Operating Oil and Gas Wells in California

All California oil and gas wells (development and prospect wells), enhanced-recovery wells, water-disposal wells, service wells (i.e. structure, observation, temperature observation wells), core-holes, and **gas-storage wells**, onshore and offshore (within three nautical miles of the coastline), located on state and private lands, are permitted, drilled, operated, maintained, plugged and abandoned under requirements and procedures administered by the Department of Conservation's Division of Oil, Gas, and Geothermal Resources (DOGGR).

Natural Gas and California

The California Public Utilities Commission (PUC) regulates natural gas utility service for approximately 10.8 million customers that receive natural gas from Pacific Gas and Electric (PG&E), Southern California Gas (SoCalGas), San Diego Gas & Electric (SDG&E), Southwest Gas, and several smaller natural gas utilities. The CPUC also regulates independent storage operators Lodi Gas Storage, Wild Goose Storage, Central Valley Storage and Gill Ranch Storage.

The vast majority of California's natural gas customers are residential and small commercial customers, referred to as "core" customers, who accounted for approximately 32% of the natural gas delivered by California utilities in 2012. Large consumers, like electric generators and industrial customers, referred to as "noncore" customers, accounted for approximately 68% of the natural gas delivered by California utilities in 2012.

The PUC regulates the California utilities' natural gas rates and natural gas services, including in-state transportation over the utilities' transmission and distribution pipeline systems, **storage**, procurement, metering and billing.

Natural gas from out-of-state production basins is delivered into California via the interstate natural gas pipeline system. Most of the natural gas transported via the interstate pipelines, as well as some of the California-produced natural gas, is delivered into the PG&E and SoCalGas intrastate natural gas transmission pipeline systems (commonly referred to as California's "backbone" natural gas pipeline system). Natural gas on the utilities' backbone pipeline systems is then delivered into the local transmission and distribution pipeline systems, or to **natural gas storage fields**.

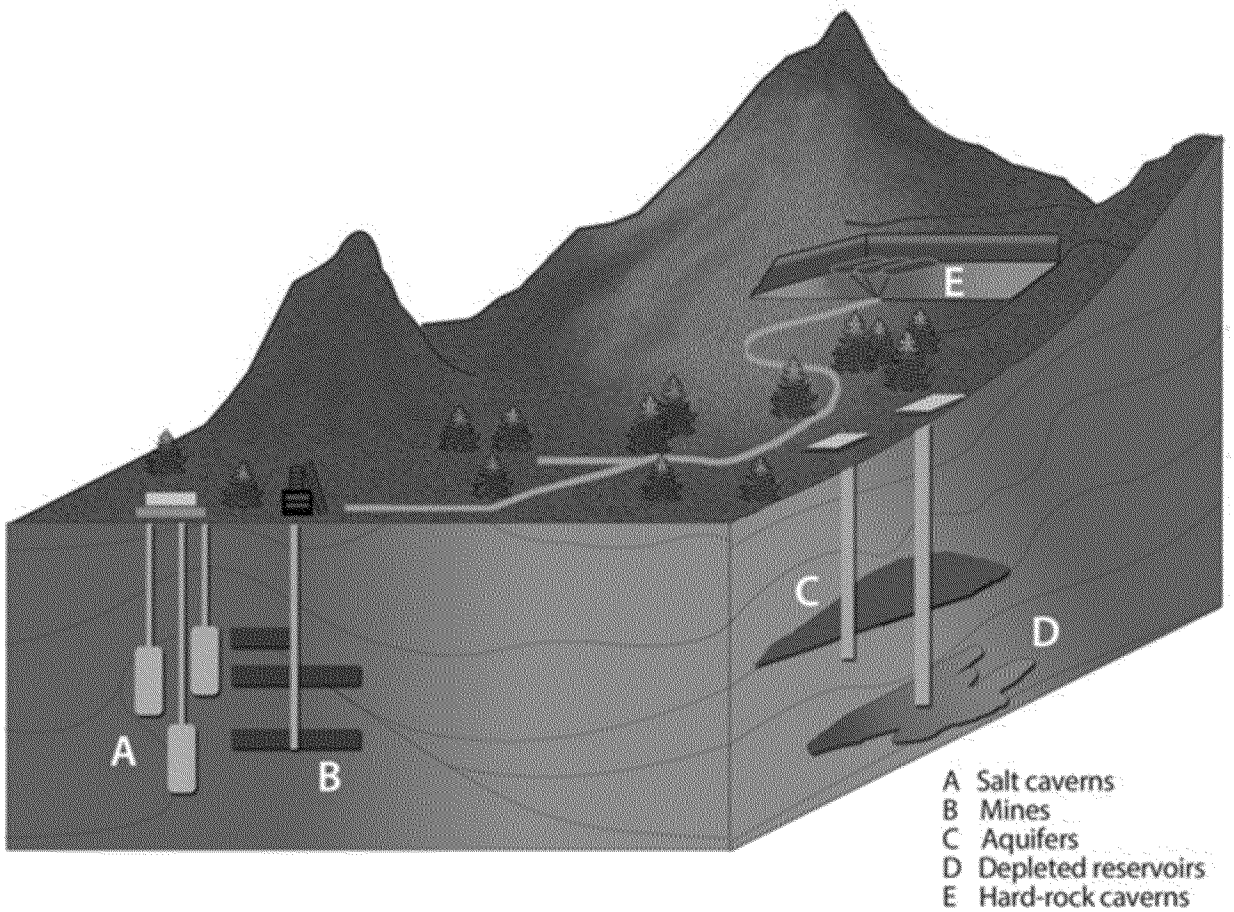
PG&E and SoCalGas own and operate several **natural gas storage fields** that are located in northern and southern California. These storage fields, and four independently owned storage utilities – Lodi Gas Storage, Wild Goose Storage, Central Valley Storage, and Gill Ranch Storage – help meet peak seasonal natural gas demand and allow California natural gas customers to secure natural gas supplies more efficiently.

California Public Utilities Commission (CPUC) regulates much of California Natural Gas

- Over 100,000 miles of pipelines and over 200 billion cubic feet (Bcf) of storage capacity
- CPUC regulates gas storage providers

Natural gas–a colorless, odorless, gaseous hydrocarbon–may be stored in a number of different ways. It is most commonly held in inventory underground under pressure in three types of facilities. These underground facilities are depleted reservoirs in oil and/or natural gas fields, aquifers, and salt cavern formations. Each storage type has its own physical characteristics (porosity, permeability, retention capability) and economics (site preparation and maintenance costs, deliverability rates, and cycling capability), which govern its suitability for particular applications. Two important characteristics of an underground storage reservoir are its capacity to hold natural gas for future use and the rate at which gas inventory can be withdrawn–called its deliverability rate. Most existing natural gas storage in the United States is in **depleted natural gas or oil fields** that are close to consumption centers. Conversion of a field from production to storage duty takes advantage of existing wells, gathering systems, and pipeline connections. Depleted oil and natural gas reservoirs are the most commonly used underground storage sites because of their wide availability.

Figure 1. Types of underground natural gas storage facilities



Source: PB-KBB, inc., enhanced by EIA.

The principal owners/operators of underground storage facilities are interstate pipeline companies, intrastate pipeline companies, local distribution companies (LDCs), and independent storage service providers. About 120 entities currently operate the nearly 400 active underground storage facilities in the Lower 48 states. If a storage facility serves interstate commerce, it is subject to the jurisdiction of the Federal Energy Regulatory Commission (FERC); otherwise, **it is state-regulated**.

Owners/operators of storage facilities are not necessarily the owners of the natural gas held in storage. In fact, most working gas held in storage facilities is held under lease with shippers, LDCs, or end users who own the gas. The type of entity that owns/operates the facility will determine to some extent how that facility's storage capacity is utilized.

For example, **interstate pipeline companies** rely heavily on underground storage to facilitate load balancing and system supply management on their long-haul transmission lines. FERC regulations allow interstate pipeline companies to reserve some portion of their storage capacity for this purpose. Nonetheless, the bulk of their storage capacity is leased to other industry participants. **Intrastate pipeline companies** also use storage capacity and inventories for similar purposes, in addition to serving customers.

In the past, **LDCs** have generally used underground storage exclusively to serve customer needs directly. However, some LDCs have recognized and have been able to pursue the opportunities for additional revenues available with the deregulation of underground storage (see **"Open Access" to Storage Capacity**, below). These LDCs, which tend to be the ones with large distribution systems and a number of storage facilities, have been able to manage their facilities so they can lease a portion of their

Underground Natural Gas Storage Data

The U.S. Energy Information Administration (EIA) collects a variety of data on the storage measures discussed above, and EIA publishes selected data on a weekly, monthly, and annual basis. EIA uses Form EIA-912, *Weekly Natural Gas Storage Report*, to collect data on end-of-week working gas in storage at the company and regional level from a sample of all underground natural gas storage operators. The regions used for weekly reporting were formally the East, West and Producing regions. Data from the EIA-912 survey are tabulated and published weekly at regional and national levels. The EIA-191, *Monthly Underground Gas Storage Report*,, collects data on total capacity, base gas, working gas, injections, and withdrawals, by reservoir and by storage facility, from all underground natural gas storage operators. Data derived from the EIA-191 survey are published at a state level on a monthly basis in the *Natural Gas Monthly*, with select data available at the field level in the Natural Gas Respondent Query System. The data shown in the *Natural Gas Monthly* include tabulations of base gas, total inventories, total storage capacity, injections, and withdrawals at state and regional levels.